IN THE CLAIMS

1. (Original) A method of authenticating registration reply messages received by a PCF that are purportedly responsive to registration messages previously sent by the PCF to a PDSN, said method comprising:

determining a verification threshold for validating time stamps in registration reply messages;

generating a sequence of message numbers for sequential use in a series of successive registration messages sent by said PCF to said PDSN, said sequence of message numbers having a repeat interval greater than said verification threshold;

inserting said sequential message numbers into successive registration messages sent by said PCF to said PDSN;

receiving a registration reply message at said PCF presumptively sent by said PDSN in response to a registration message previously sent by said PCF, said registration reply message containing a time stamp and a message number;

validating said message number in said registration reply message by comparing said message number in said registration reply message to the message number in a corresponding registration message sent by said PCF;

if said message number is valid, validating said time stamp in the said registration reply.

2. (Original) The method of claim 1 wherein validating said time stamp in said registration reply message comprises computing an age of said registration reply message based on said time stamp in said registration reply message and accepting said registration reply message if said age is less than a verification threshold.

3. (Original) The method of claim 2 wherein computing the age of said registration reply message comprises computing a time difference between said time stamp in said registration reply message and a time reference.

4. (Original) The method of claim 2 wherein computing the age of said registration reply message comprises computing a time difference between said time stamp in said registration reply message and a time stamp in a corresponding registration message.

5. (Original) The method of claim 1 wherein validating said time stamp in said registration reply message comprises:

    comparing said time stamp in said registration reply message to the time stamps in one or more registration messages sent by said PCF;

    accepting said registration reply message if said time stamp in said registration reply message equals the time stamp in a corresponding registration message;

    if said time stamp in said registration reply message does not equal the time stamp in said corresponding registration message, computing an age of said registration reply message based on said time stamp in said registration message;

    accepting said registration reply message if said age of said registration reply message is less than a verification threshold.

6. (Original) The method of claim 5 wherein computing an age of said registration reply message based on said time stamp in said registration reply message is performed conditionally only if:

    said registration reply message contains a predetermined code; and

    said time stamp in said registration reply message does not equal said time stamp in said registration message; and

    wherein said registration reply message is rejected if said predetermined code is not present and said time stamp in said registration reply message does not match said time stamp in said registration message.

7. (Original) The method of claim 1 further comprising maintaining a time reference in said PCF.

8. (Original) The method of claim 7 further comprising synchronizing said time reference to a time clock located at said PDSN.

9. (Original) The method of claim 8 wherein synchronizing said time reference to a time clock located at said PDSN comprises determining a difference between said time reference and said PDSN time clock.

10. (Original) The method of claim 8 wherein validating said time stamp in said registration reply message comprises computing an age of said registration reply message based on said time stamp in said registration reply message and accepting said registration reply message if said age is less than a verification threshold.

11. (Original) The method of claim 10 wherein computing the age of said registration reply message comprises computing a time difference between said time stamp in said registration reply message and a time stamp in a corresponding registration message.

12. (Original) The method of claim 10 wherein computing the age of said registration reply message comprises computing a time difference between said time stamp in said registration reply message and said time reference.

13. (Original) The method of claim 1 wherein generating a sequence of message numbers comprises incrementing said message number in each successive registration message sent by said PCF to said PDSN.

14. (Original) The method of claim 13 wherein incrementing said message number in each successive registration message sent by said PCF to said PDSN comprises adding a random number to a previous message number.

15. (Original) The method of claim 13 wherein said sequence of message numbers increases monotonically.

16. (Currently Amended) A method of authenticating a second registration message received by a PCF that is purportedly responsive to a first registration message previously sent by the PCF to the PDSN, said method comprising:

inserting a message number into said first registration message;

sending said first registration message from said PCF to said PDSN;

receiving said second registration message at said PCF responsive to said first registration message, said second registration message containing a time stamp and said message number from said first registration message;

authenticating said second registration message based on said message number and said time stamp <u>by validating said message number in said second registration message and if said message number is valid, validating said time stamp in said second registration message, wherein validating said time stamp in said second registration message comprises:</u>

~~accepting said second registration message if said second registration message contains a valid message number and a valid time stamp~~

<u>comparing said time stamp in said second registration message to said time stamp in said first registration message;</u>

<u>accepting said second registration message if said time stamp in said second registration message equals said time stamp in said first registration message;</u>

<u>if said time stamp in said second registration message does not equal said time stamp in said first registration message, computing an age of said second registration message based on said time stamp in said first registration message; and</u>

<u>accepting said second registration message if said age of said second registration message is less than a verification threshold.</u>

17-21. (Cancelled).

22. (Currently Amended) The method of claim ~~21~~ 16 wherein computing an age of said second registration message based on said time stamp in said second registration message is performed conditionally only if:

    said second registration message contains a predetermined code; and

    said time stamp in said second registration message does not equal said time stamp in said

        first registration message; and

    wherein said second registration message is rejected if said predetermined code is not

        present and said time stamp in said second registration message does not match said

        time stamp in said first registration message.

23. (Original) The method of claim 16 further comprising maintaining a time reference in said PCF.

24. (Original) The method of claim 23 further comprising synchronizing said time reference to a time clock located at said PDSN.

25. (Original) The method of claim 24 wherein synchronizing said time reference to a time clock located at said PDSN comprises determining a difference between said time reference and said PDSN time clock.

26. (Original) The method of claim 24 wherein validating said time stamp in said second registration message comprises computing the age of said second registration message and comparing said age to a verification threshold.

27. (Original) The method of claim 26 wherein computing the age of said second registration message comprises computing a time difference between said time stamp in said second registration message and said time reference.

28. (Original) The method of claim 24 further comprising generating a time stamp for said first registration message sent by said PCF to said PDSN based on said time reference.

29. (Original) The method of claim 28 wherein computing the age of said second registration message comprises computing a time difference between said time stamp in said second registration message and said time stamp in said first registration message.

30. (Original) A method of guarding against erroneous re-synchronization of a first reference time used by a packet control function (PCF) to time-stamp messages sent to a packet data serving node (PDSN) with a second reference time used by said PDSN in validating said messages sent by said PCF, the method comprising:

   receiving a message presumptively from said PDSN at said PCF indicating that said first reference time requires re-synchronization with said second reference time, said message containing a PDSN time value;

   comparing said PDSN time value with said first reference time to determine a time difference; and

   adjusting said first reference time based on said PDSN time value if said time difference does not exceed a pre-determined time threshold.

31. (Original) The method of claim 30 wherein receiving a message presumptively from said PDSN at said PCF indicating that said first reference time requires re-synchronization with said second reference time comprises receiving a registration reply message purportedly responsive to a registration message previously sent by said PCF to said PDSN.

32. (Original) The method of claim 31 wherein said registration message includes an identifier, comprising a PCF time stamp and a message number, and further comprising verifying that said registration reply message contains a matching message number.

33. (Original) The method of claim 32 wherein said message number in said registration message is part of sequence of message numbers with a repeat interval greater than said pre-determined time threshold.

34. (Original) The method of claim 30 further comprising:

maintaining a base PCF time at said PCF; and

determining said first reference time at said PCF by adjusting a copy of said base PCF time

in accordance with said PDSN time value.

35. (Original) The method of claim 34 further comprising synchronizing said base PCF time with

a network-based time.

36-45. (Cancelled).

46. (New) A method of authenticating a second registration message received by a PCF that is purportedly responsive to a first registration message previously sent by the PCF to the PDSN, said method comprising:

inserting a message number into said first registration message;

sending said first registration message from said PCF to said PDSN;

receiving said second registration message at said PCF responsive to said first registration message, said second registration message containing a time stamp and said message number from said first registration message;

authenticating said second registration message based on said message number and said time stamp by validating said message number in said second registration message and if said message number is valid, validating said time stamp in said second registration message, wherein validating said time stamp in said second registration message comprises:

computing a time difference between said time stamp in said second registration message and a time stamp in said first registration message; and

comparing said time difference to a the verification threshold; and

accepting said second registration message if said second registration message contains a valid message number and a valid time stamp.